

DOCKET NO.: CHOI-0038
Application No.: 09/678,171
Office Action Dated: July 21, 2003

PATENT
REPLY FILED UNDER EXPEDITED
PROCEDURE PURSUANT TO
37 CFR § 1.116

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. **(Currently amended)** A supported catalyst for producing a syndiotactic styrenic polymer, which comprises:

(a) a support layer;

(b) a polymer layer coated onto the support layer, wherein the polymer layer comprises a polymer which comprises polar groups; interacts with the surface of the support layer; and is insoluble in styrenic monomer or polymerization solvent during use of the supported catalyst during polymerization of the styrene monomers to produce syndiotactic styrene polymer, and

(c) a metallocene catalyst layer,

wherein the polymer layer is located between the support layer and the metallocene catalyst layer [wherein the polymer layer comprises a polymer that (1) has polar groups that insulate the metallocene catalyst from the support (2) interacts with the surface of the support, and (3) is insoluble in the styrenic monomer or polymerization solvent during use of the supported catalyst during polymerization of styrene monomers to produce syndiotactic styrene polymer] such that the polymer layer insulates the metallocene layer from the support layer to prevent poisoning of the metallocene catalyst layer by the support layer.

2-3. **(Cancelled)**

4. **(Currently amended)** The supported catalyst of claim 1 in which said polymer is selected from the group consisting of acrylonitrile-containing polymers and copolymers, hydroxyl group-containing [polymer] polymers and copolymers, acrylic and acrylate polymers and copolymers, maleic anhydride-containing copolymers and maleic anhydride modified polymers, acetate containing polymers and copolymers, polyethers, polyketones, polyamide polymers and copolymers, and polyurethanes.

5. **(Currently amended)** The supported catalyst of claim 4 in which said acrylonitrile-containing polymer or copolymer is selected from the group consisting of polyacrylonitrile, acrylonitrile-styrene block copolymer, styrene-acrylonitrile random [copolymer] copolymer, acrylonitrile-butadiene-styrene resin, acrylonitrile-butadiene random copolymer, and acrylonitrile-isoprene random copolymer.

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6. (Original) The supported catalyst of claim 5 in which said styrene-acrylonitrile random copolymer has a degree of polymerization of at least 5 and contains about 0.1 to 100 % by weight of acrylonitrile.

7. (Previously Presented) The supported catalyst of claim 1 in which said polymer is about 0.0001 to 99.999 % by weight of the supported catalyst.

8. (Previously Presented) The supported catalyst of claim 1 in which said support layer is an organic material selected from the group consisting of poly(styrene-co-divinylbenzene) beads, starch powder and polyolefin powder.

9. (Previously Presented) The supported catalyst of claim 1 in which said support layer is an inorganic material selected from the group consisting of silica gel, alumina, silica-alumina gel, zeolites, mica powder, clays, molecular sieves, metal oxide compounds, metal halogenides, metal carbonates and metal powder.

10. (Previously Presented) The supported catalyst of claim 1 in which said metallocene catalyst layer comprises a metal compound of Group IVB.

11-12 (Cancelled)

13. (Previously Presented) The supported catalyst of claim 1 in which said polymer is about 0.0001 to 30 % by weight of the supported catalyst.

14. (Previously Presented) The supported catalyst of claim 1 further comprising (d) an alkyl aluminoxane and/or (e) an alkyl aluminum compound.

15. (Currently Amended) A method of preparing a supported catalyst for producing a syndiotactic styrenic polymer, which comprises:

providing [a support precursor by drying] a slurry [of] comprising a support, a polymer to be coated onto the support, and a solvent;

coating the support with the polymer;

drying the slurry; and

adding a metallocene catalyst and a solvent to the [support precursor] dried slurry to create a supported catalyst such that the polymer is located between the support and the catalyst.

16. (Currently amended) The method of preparing a supported catalyst according to claim 15, which further comprises:

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adding an alkyl aluminoxane and/or an alkyl aluminum compound to the slurry prior to the second step.

17-19. (Cancelled)

20. (Currently amended) A supported catalyst comprising:

a support layer;
a metallocene catalyst layer; and
a polymer layer comprising polar groups, wherein the polymer layer is located between the support layer and the metallocene catalyst layer, and wherein the [polymer layer insulates] polar groups absorb the metallocene catalyst layer, thereby insulating the metallocene catalyst layer from poisoning by the [catalytic activity of the metallocene catalyst] acidic surface of the support layer.

21 (Currently amended) The supported catalyst of claim 20 in which said polymer is selected from the group consisting of acrylonitrile-containing polymers and copolymers, hydroxyl group-containing [polymer] polymers and copolymers, acrylic and acrylate polymers and copolymers, maleic anhydride-containing copolymers and maleic anhydride modified polymers, acetate containing polymers and copolymers, polyethers, polyketones, polyamide polymers and copolymers, and polyurethanes.

22. (Previously Presented) The supported catalyst of claim 21 in which said acrylonitrile-containing polymer or copolymer is selected from the group consisting of polyacrylonitrile, acrylonitrile-styrene block copolymer, styrene-acrylonitrile random [copolymer] copolymer, acrylonitrile-butadiene-styrene resin, acrylonitrile-butadiene random copolymer, and acrylonitrile-isoprene random copolymer.

23. (Previously Presented) The supported catalyst of claim 22 in which said acrylonitrile-containing polymer or copolymer is a styrene-acrylonitrile random copolymer that has a degree of polymerization of at least 5 and contains about 0.1 to 100 % by weight of acrylonitrile.

24. (Previously Presented) The supported catalyst of claim 20 in which said polymer is about 0.0001 to 99.999 % by weight of the supported catalyst.

25. (Currently Amended) The supported catalyst of claim [1] 20 in which said support layer is an organic material selected from the group consisting of poly(styrene-co-divinylbenzene) beads, starch powder and polyolefin powder.

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26. **(Currently Amended)** The supported catalyst of claim [1] 20 in which said support layer is an inorganic material selected from the group consisting of silica gel, alumina, silica-alumina gel, zeolites, mica powder, clays, molecular sieves, metal oxide compounds, metal halogenides, metal carbonates and metal powder.